for presentation at the Eightieth Meeting, but was not delivered.)

2:12

PP2. Lateralization of Tone Stimuli by Rhesus Monkeys. J. G. WEGENER, *Center for Neural Sciences, Indiana University, Bloomington, Indiana 47401.*—Six monkeys were trained to sit quietly in a chair wearing a tight-fitting plastic helmet. Sounds were delivered to either ear separately or to both ears simultaneously via condenser microphones placed in the helmet and directed toward the auditory meatus. To date we have examined single-ear thresholds for a 500-Hz tone doubled at the transducer to a 1000-Hz tone. We have also determined the interaural intensity thresholds and have begun the study of phase difference lateralization. Sound levels with a monkey head in the helmet have not yet been determined. Measurements with an open helmet, including normal sound room ambient noise, averaged 61 dB *re* 0.0002 dyn/cm^2 at the frequency used and at 0-dB attenuation. The 75% correct level of performance for all single ears averaged 27.8 dB below the measured 0-dB level (range: 24.8–30.5 dB). The average difference between ears of the same animal was 1.9 dB (range: 0.6–3.0 dB). The average 75% correct interaural intensity threshold for six monkeys was 1 dB (range: 0.9–1.3 dB). [Supported by NINDS grant.]

2:24

PP3. Sound Localization in the Barn Owl. M. KONISHI, *Department of Biology, Princeton University, Princeton, N. J. 08540.*—Barn owls (*Tyto alba*) can use sound to catch prey in total darkness. Two barn owls were trained to strike protected loudspeakers emitting various artificial sounds. The accuracy of localization depended on the frequency, bandwidth, and temporal pattern of the test sound. Continuous pure tones of frequencies below 6 kHz and above 9 kHz were hard to localize. The accuracy improved as the frequency increased from 6 to 9 kHz. Within this range continuous sounds containing two frequencies were more accurately localized than either frequency alone. Sustained wide-band noises always assured precise localization. The owls localized tone bursts more accurately than continuous tones. Whatever signals were used, accurate localization was largely due to the owls' ability to use the sounds for guiding the flight direction. The midcourse correction could occur during a flight lasting as short as 1 sec. When the signal was switched from one speaker to another after takeoff, the birds could strike the second speaker.

2:36

PP4. Hearing in Two Species of Wild Rodents. HENRY HEFFNER, RONALD VANOEVEREN, AND BRUCE MASTERTON, *Department of Psychology, Florida State University, Tallahassee, Florida 32306.*—As part of a systematic study of the auditory capacities of mammals, behavioral audiograms were determined for two species of wild rodents: the cotton rat (*Sigmodon hispidus*) and the house mouse (*Mus musculus*). The method of conditioned suppression was used to assess thresholds for frequencies ranging from 0.5 to 91 kHz. Comparisons of the two audiograms with each other and with an updated sample of those of other mammals yield support for two previously discovered (inverse) relationships between high- and low-frequency hearing and between high-frequency hearing and interaural distance (maximum Δt). However, a partial correlation in which high-frequency hearing is held constant reveals that low-frequency hearing is not related to maximum Δt. The updated sample of mammalian audiograms now provides firmer ground for concluding what does and what does not constitute a bizarre auditory adaptation. For example, bats are neither unique nor bizarre in their ability to hear extremely high frequencies nor in their inability to hear low frequencies.

3:00

PP5. Narrow-Band CW/FM Echolocation in Bats. J. A. SIMMONS, *Auditory Research Laboratories, Princeton University, Princeton, New Jersey 08540.*—The horseshoe bat, *Rhinolophus ferrumequinum*, emits sonar cries that rise slightly in frequency to about 83 kHz, remain constant at 83 kHz for 10–50 msec or so, and then during the last millisecond or two sweep downward to 65 or 70 kHz. Other laboratories have reported that the bat adjusts its outgoing CW frequency to keep the returning echo frequency at 83.4 kHz regardless of Doppler shift. Discrimination experiments indicate that *Rhinolophus* uses the terminal FM signal for target ranging, achieving an acuity of about 30 mm with a cross-correlation sonar receiver. The FM and CW signals are separated by sharply tuned auditory mechanisms into different populations of neurons. Such separation is vital in a correlation receiver to prevent contamination of the FM signal with the CW signal and consequent loss of acuity in ranging. Doppler-shift compensation is necessary because the narrow-band FM waveform of *Rhinolophus* is subject to intolerably large Doppler ranging errors. Other bats that use correlation receivers avoid severe Doppler ranging errors by transmitting broad-band FM signals.

3:15

PP6. The Susceptibility of the Chinchilla Ear to Damage from Impulsive Noise. G. A. LUZ AND J. D. MOSKO, *Experimental Psychology Division, US Army Medical Research Laboratory, Fort Knox, Kentucky 40121.*—Chinchillas were exposed to the same levels of impulsive noise as were a group of monkeys. The impulses (of 168-dB peak pressure) resulted in large hearing losses in the chinchillas, although only slight losses were observed in monkeys exposed to the equivalent number of impulses, and no losses were observed in humans exposed to more than the equivalent number of impulses. This finding appears consistent with past knowledge of the anatomical differences between the ear of the monkey and the chinchilla.

3:20

PP7. Effect of Snowmobile Noise on Small Rodents. F. G. HAAG, W. A. WALKER, AND G. N. DEMARTINO, *Mechanical Engineering Department, Union College, Schenectady, New York 12308.*—The relationship between immediate activity response and snowmobile noise level was measured for 30 female white mice ranging in age between 90 and 120 days. The mice were divided into three groups: the first was exposed to 85±4 dB (flat); the second to 95±4 dB (flat); and the third was a control group. The sound was a tape recording of several snowmobiles. The predominate tones were at about 500 and 1000 Hz. The mice were exposed for a period of 1 min for approximately three times each day. The experiment lasted for 24 days. Once each day the motion of each mouse was measured in an activity box during the exposure and for 5 min following the exposure. The data does not show a statistically significant difference in immediate activities between the exposed and nonexposed mice. The over-all stress response was measured by adrenal gland weight. At the end of the experiment, the adrenal gland weight was determined for each mouse. There was no statistical difference in adrenal weight per unit body weight between the exposed and control groups.